The NANC identified two advantages that would result from the selection of two database administrators. First, the NANC notes that if one administrator could not or would not perform its obligations under its master contract, or declines to renew this contract, there would be another administrator with the experience and expertise required to provide these services quickly and with minimal disruption to the industry. Second, the NANC observes that having multiple database administrators permits competition in both the initial and future competitive bidding and selection processes, which should enable carriers to obtain more favorable terms and conditions than if only one database administrator had been selected.[114] The NANC concludes that the selection of two database administrators is consistent with the Commission's directive that the NANC recommend the most cost-effective number portability methods.[115]

### b. Positions of the Parties

37. None of the commenting parties addresses the number of local number portability database administrators that should be selected.

### c. Discussion

38. By the time the NANC submitted its recommendations to the Commission, the seven regional LLCs had independently selected two separate database administrators: Lockheed Martin and Perot Systems. For that reason, the NANC concluded it was unnecessary to address whether more than one administrator should be required. We find that the NANC acted reasonably in assessing whether having two administrators would be appropriate, and thus we decline to disturb this result. Further, we agree, for the reasons given by the NANC, that there are clear advantages to having at least two experienced number portability database administrators that can compete with and substitute for each other, thereby promoting cost-effectiveness and reliability in the provision of Number Portability Administration Center services. While we recognize the likely benefits of having at least two administrators, we do not, at this time, adopt a requirement that two or any other number of entities serve as local number portability database administrators.

[114] *Id.* at § 6.3.5.

[115] *Id.*

### 4. General Duties of Database Administrators

#### a. Background

39. The Commission directed the NANC to determine the duties of the local number portability database administrators.[116] The NANC describes these duties generally in its architecture plan for number portability,[117] and states that "[t]he primary role of the [local number portability database administrator] will be to assist users in obtaining access to the [Number Portability Administration Center] SMS."[118] To perform this duty, the NANC recommends that the local number portability database administrators perform the following functions: administration, user support, and system support.[119] The NANC recommends that the administrative functions of the local number portability database administrator include all management tasks required to run the Number Portability Administration Center, including the provision of reports to regulatory bodies as required.[120]

40. With respect to user support,[121] the NANC recommends that the local number portability database administrators: (1) work with users "to update data tables required to route calls for ported local telephone numbers or required for [number portability] administration;" (2) be responsible for Number Portability Administration Center SMS log on administration, user access, data security, user notifications, and management; (3) serve as the primary contact for users that encounter problems with Number Portability Administration Center system features; and (4) provide users with a central point of contact

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[116] *First Report & Order*, 11 FCC Rcd at 8402, ¶ 95.

[117] *Working Group Report* at § 6.5.2; *see also Architecture Task Force Report* at § 12. The NANC describes the duties of the local number portability database administrator more specifically in the Functional Requirements Specification (FRS) and Interoperable Interface Specification (IIS). The FRS and IIS describe, for example, the responsibilities of the administrator in the areas of data administration, subscription management, SMS interfaces, system security, reports, performance and reliability, and billing. *Working Group Report* at § 6.5.2. The NANC recommendations regarding the Functional Requirements Specification and Interoperable Interface Specification are discussed in ¶¶ 59 - 64, *infra*.

[118] *Architecture Task Force Report* at § 12.5.2.

[119] *Id.*

[120] *Id.* at § 12.5.3.

[121] The term "user support" refers to those functions the local number portability database administrator would perform to enable carriers to perform database dips in order to provide number portability.

for reporting and resolving Number Portability Administration Center problems.[122] In addition, in the event that a new local number portability database administrator is selected, the NANC recommends that the outgoing local number portability database administrator be required to provide the same quality of service during the period of transition to a new Number Portability Administration Center, and that the transition to a new database administrator be transparent to users. The NANC further recommends that sufficient time be given for carriers to use both systems simultaneously during such transition in order to allow them to install and test links to the new Number Portability Administration Center, remove any equipment or connections to the old Number Portability Administration Center, install any necessary equipment at disaster recovery sites, and resolve any problems arising from the transition.[123]

41. With respect to system support, the NANC recommends that the local number portability database administrators: (1) provide coordination/resolution of problems associated with system availability, communications and related capabilities; (2) operate 24 hours a day, seven days a week; and (3) meet the service level requirements established by their respective LLCs.[124]

42. The NANC justifies the foregoing recommendations, in part, by noting that they represent the consensus recommendations of industry technical experts.[125] The NANC also finds support for its recommendations in the work of carriers and others at the regional level; the NANC notes that its architecture task force reviewed the process used in each state/region to develop detailed technical standards documents, the Functional Requirements Specification (FRS) and Interoperable Interface Specification (IIS), and determined that the Number Portability Administration Center roles and responsibilities defined in those documents were substantially similar across regions.[126] Moreover, the NANC refers to the duties in the FRS and IIS as "standard functions" that are "necessary to administer [the number portability] system and its databases, the interfaces between the system and those of the various service providers, as well as the administrative functions performed by [local

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[122] *Architecture Task Force Report* at § 12.5.3.

[123] *Id.* at § 12.5.4.

[124] *Id.* at § 12.5.3.

[125] *Working Group Report* at § 6.5.5.

[126] *Id.* at § 6.5.3. These technical standards documents are discussed more fully below. *See* ¶¶ 59 - 64, *infra.*

number portability database administrator] personnel."[127] In addition, the NANC notes that Lockheed Martin and Perot Systems are currently developing systems and processes in accordance with the general and specific duties the NANC describes in its architecture plan and in the FRS and IIS.[128]

### b. Positions of the Parties

43. None of the commenting parties addresses the NANC's recommendations regarding the general duties of the local number portability database administrators.

### c. Discussion

44. We adopt the NANC's recommendations regarding the general duties of the local number portability database administrators. The NANC defined these duties based on input from the industry at the national, regional and state levels, and none of the commenting parties objects to them. These duties also appear to be consistent with the types of activities the Commission tentatively concluded would be necessary to deploy long-term number portability. For example, the Commission tentatively concluded that costs for long-term portability would be attributable to the "development and implementation of the hardware and software for the database," to the "maintenance, operation, security, administration, and physical property associated with the database," and to the "uploading, downloading, and querying" associated with the database.[129] Moreover, the duties appear to be reasonably comprehensive, so as to enable the number portability administrators to implement the architecture and technical specifications developed by the NANC, and neither the Commission nor the parties has identified any record evidence that indicates a need to adopt general duties in addition to those recommended by the NANC. We also note that the NANC based these general duties on the more specific duties described in the FRS and IIS and that the NANC's description of the underlying specific duties in the FRS and IIS as "standard functions" suggests that both the specific and general duties the NANC recommends are noncontroversial.[130]

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[127] *Working Group Report* at § 6.5.3.

[128] *Id.* at § 6.5.5.

[129] *First Report & Order,* 11 FCC Rcd at 8463, ¶ 216 (the discussion of cost recovery for long-term number portability is found in the *Further Notice of Proposed Rulemaking* adopted with the *First Report & Order*).

[130] For a more detailed discussion of the specific duties in the FRS and IIS, *see* ¶¶ 59 - 64, *infra.*

## B. Technical and Operational Standards

### 1. Background

45. In the *First Report & Order*, the Commission directed the NANC to make recommendations regarding "the technical interoperability and operational standards, the user interface between telecommunications carriers and the [local number portability administrators], and the network interface between the [regional database] and the downstream databases," and to develop the technical specifications for the regional databases.[131] The NANC, through the Working Group and its Technical & Operational Task Force, recommends the following uniform national standards and procedures for the implementation of local number portability:

(a) industry standard provisioning process flows (Provisioning Process Flows) that detail the precise procedures by which service providers and local number portability administrators communicate between and among one another to accomplish the various tasks required to implement local number portability;
(b) an industry standard functional requirements specification (Functional Requirements Specification or FRS) that defines the functional requirements of the Number Portability Administration Center Service Management System;
(c) an industry standard interoperable interface specification (Interoperable Interface Specification or IIS) that defines the interfaces between the Number Portability Administration Center Service Management System and the service providers' local Service Management Systems;
(d) an industry-wide process for the porting of reserved and unassigned numbers and a process to enforce compliance; and
(e) an industry-wide procedure for designing, developing, testing, and implementing changes to the Functional Requirements Specification, the

[131] *First Report & Order*, 11 FCC Rcd at 8402, ¶ 95. The "downstream databases" are the Service Control Points and the local Service Management System databases that carriers will regularly access to determine if a telephone number has been ported. The "regional databases" are the Number Portability Administration Center Service Management System databases, maintained by the local number portability administrators, which contain the lists of all ported telephone numbers and routing information. For an explanation of the local and regional number portability databases and how they interact, *see* ¶ 8, *supra*.

Interoperable Interface Specification and related processes.[132]

The NANC determined that adoption of these uniform national standards and procedures would produce the following positive results: facilitate the industry's ability to meet number portability implementation deadlines; maximize the use of local number portability resources for all companies; foster the design of associated processes by other industry groups; promote development of timely and cost effective offers of local number portability related products; minimize the expenditure of time and resources; and improve service quality nationwide, particularly by carriers serving multiple regions.[133]

46. In developing these standards and procedures, the Working Group delegated responsibility for defining technical standards, including interoperability operational standards, network interface standards and technical specifications, to the Technical & Operational Task Force.[134] The conclusions of that Task Force are documented in the *Technical & Operational Task Force Report* and incorporated into the *Working Group Report* at Appendix E.[135]

47. The Technical & Operational Task Force reviewed the activities in each of the seven Number Portability Administration Center regions to evaluate the local number portability planning activities already underway and determined that industry representatives were developing local number portability technical and operational specifications concurrently in each region.[136] As noted above, prior to the formation of the Task Force, carriers in Illinois, Georgia, California, Maryland, Colorado, New York, and Texas had already formed LLCs and issued RFPs, inviting potential database administrators to submit proposals to provide a Number Portability Administration Center Service Management System.[137]

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[132] *Working Group Report* at § 6.7.3. These standards and procedures are detailed in the *Technical & Operational Task Force Report* and its appendices. The NANC has recommended adoption of these standards and procedures as set forth in these documents, which have been incorporated by reference into the *Working Group Report*.

[133] *Id.* at § 6.7.5.2.

[134] *Technical and Operational Task Force Report* at § 1.2. The Technical & Operational Task Force convened 17 times between November 18, 1996 and April 18, 1997 to develop the technical and operational standards and procedures. *Working Group Report* at § 2.6.2.

[135] *Working Group Report* at § 6.7.2.

[136] *Technical and Operational Task Force Report* at § 5.1.

[137] *See* ¶ 26, *supra*.

48. The Technical & Operational Task Force's review of state/regional local number portability activities revealed that the RFPs issued in each region contained substantially similar documents that define the Number Portability Administration Center Service Management System requirements and the mechanized interface requirements.[138] The RFP in each region included, either as an attachment or by reference, a Functional Requirements Specification, which defines the functional requirements for the Number Portability Administration Center Service Management System, and an Interoperable Interface Specification, which contains the information model for the Number Portability Administration Center Service Management System mechanized interfaces.[139] The Technical & Operational Task Force also reviewed the Number Portability Administration Center Service Management System Provisioning Process Flows,[140] which each state/regional workshop was addressing independently.[141]

49. In reviewing the content of the regionally-developed Functional Requirements Specification, the Interoperable Interface Specification, and Provisioning Process Flows, the Technical & Operational Task Force determined that the work underway in the seven Number Portability Administration Center regions was producing essentially equivalent technical and operational specifications and procedures, so that carriers effectively were duplicating efforts across the regions.[142] Finding that the regionally-developed specifications adequately addressed the number portability implementation issues, the Technical &

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[138] *Working Group Report* at § 2.5.1.

[139] *See id.* at § 2.5.3.

[140] *Technical & Operational Task Force Report* at § 7 and Appendix B -- "Inter-Service Provider LNP Operations Flows." "Inter-service provider" processes refer to the ways in which service providers transfer information between and among themselves. Appendix B documents the various inter-service provider and Number Portability Administration Center Service Management System processes, pictorially describing the specific processes by which local number portability functions are executed, such as the process by which a customer's number is transferred from the customer's original service provider to the customer's new service provider.

[141] *Working Group Report* at § 2.5.1.

[142] *Technical & Operational Task Force* at § 5.2. The similarities across regions were, in large part, due to the fact that a number of carriers, such as AT&T and MCI, participated in each region's efforts, and proposed similar standards in each region. Furthermore, each of the regions drew extensively from the pioneering efforts of the Illinois Commerce Commission's number portability workshop. *See Architecture Task Force Report* at § 5.

Operational Task Force modified, updated and standardized the regional documents,[143] and the NANC recommends adoption of these Number Portability Administration Center Service Management System technical and operational specifications as industry standards.[144]

### 2. Positions of the Parties

50. None of the comments filed with the Commission in this phase of the number portability proceeding challenges the need for national technical and operational standards. The General Services Administration (GSA) recommends that the Commission adopt the standards detailed in the *Working Group Report*, and states that replacing disparate regional approaches with uniform national standards will facilitate the development of full and open competition, result in cost savings, and help to ensure higher quality services for end users.[145] GSA also contends that the Commission should convene a proceeding to develop national guidelines for state regulatory authorities to use in developing standards for (1) dialing parity; (2) access by competing carriers to the incumbent's facilities for interconnection; (3) coordination of repair activities among interconnected carriers; and (4) access to operations support systems.[146]

### 3. Discussion

51. We applaud the extraordinary efforts of the NANC, the industry, the state commissions and the state/regional workshops in developing, in a relatively short time, technical and operational standards and procedures in order to meet our local number portability implementation schedule. As discussed below, we adopt the technical and operational standards and procedures recommended by the NANC as set forth in the *Working Group Report*.[147] We decline, however, to grant GSA's request that we convene a proceeding to develop national guidelines for state regulatory authorities to use in developing standards for dialing parity, access by competing carriers to the incumbent's facilities for interconnection, coordination of repair activities among interconnected carriers, and access to

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[143] *Technical and Operational Task Force Report* at § 5.2.

[144] *Working Group Report* at § 6.7.

[145] GSA Comments at 3.

[146] *Id.* at 4.

[147] In ¶ 128, *infra*, the Commission directs the NANC to continue to monitor local number portability implementation and to provide general oversight of number portability administration on an ongoing basis.

operations support systems at this time.[148] These issues do not directly concern the NANC's recommendations relating to number portability administration and, thus, are beyond the scope of this proceeding. The Commission, in fact, has already been addressing development of national guidelines for interconnection, repair activities, operations support systems,[149] and dialing parity[150] in other Commission proceedings. We note further that LCI International Telecom Corp. and the Competitive Telecommunications Association have filed a Petition for Expedited Rulemaking, asking the Commission to initiate a rulemaking in which the Commission ultimately would adopt reporting requirements and performance standards governing operations support systems. We have sought comment on that petition.[151]

### a. Uniform National Standards

52. We agree with the NANC that the adoption of uniform Functional Requirements Specification, Interoperable Interface Specification, Provisioning Process Flows, policy for the porting of reserved and unassigned numbers, and compliance and change management processes would provide significant advantages for the implementation of local number portability. We conclude that uniform national standards in this area will promote efficient and consistent use of number portability methods and numbering resources on a nationwide basis, ensure the interoperability of networks, and facilitate the ability of carriers to meet number portability implementation deadlines. We further conclude that uniform national standards should minimize expenditure of time and resources, maximize use

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[148] GSA Comments at 4.

[149] *Implementation of the Local Competition Provisions in the Telecommunications Act of 1996, First Report and Order*, 11 FCC Rcd 15499, 15591-92, 15660-01, 15767-68, ¶¶ 179-80, 316, 525-28 (1996) (*Local Competition Order*), *Order on Reconsideration*, 11 FCC Rcd 13042 (1996), *Second Order on Reconsideration*, 11 FCC Rcd 19738 (1996), *pets. for further recon. pending.* The First Report and Order was affirmed in part and vacated in part. *See Iowa Util. Bd. v. FCC and consolidated cases*, No. 96-3321 *et. al.*, ___ F.3d ___ , 1997 WL 403401 (8th Cir. July 18, 1997).

[150] *See Implementation of the Local Competition Provisions of the Telecommunications Act of 1996, Second Report and Order and Memorandum Opinion and Order*, FCC 96-333 (rel. Aug. 8, 1996), 61 Fed. Reg. 47284 (1996), *pets. for recon. pending, pets. for review pending sub nom., Bell Atlantic Telephone Companies et al. v. FCC et al.*, D.C. Cir. No. 96-1333, *and consolidated case*, D.C. Cir. No. 96-1337 (filed Sept. 16, 1996), and *People of the State of California, et. al., v. FCC*, 8th Cir. No. 96-3519, *mot. pending to sever and transfer to D.C. Cir.* (originally filed in D.C. Cir. Sept. 23, 1996).

[151] *Comments Requested on Petition for Expedited Rulemaking to Establish Reporting Requirements and Performance and Technical Standards for Operations Support Systems*, Public Notice, RM 9101, DA 97-1211 (rel. June 10, 1997).

of local number portability resources for all companies, produce timely and cost effective offers of local number portability related products, enable switch vendors to spread their costs over a larger base of customers, eliminate the need to develop several different versions of number portability software, and improve service quality for carriers providing service in multiple regions.[152]

53. We find that it is advantageous to all companies to maintain standard system requirements and processes to gain maximum efficiency and effectiveness in all local number portability functions. Uniform national standards will also be particularly helpful to incumbent carriers, such as GTE, that operate in multiple regions, and to new entrants, such as AT&T and MCI, that may seek to enter the local exchange market on a national scale. Furthermore, uniform national standards will allow vendors to develop standard products rather than multiple versions of hardware and software necessary to implement local number portability based on regional differences, resulting in more timely and cost effective product offerings for local service providers.[153]

### b. Specific Technical Standards Addressed by the Technical & Operational Task Force

54. We conclude that the NANC's recommended technical and operational standards are consistent with the Commission's performance criteria for implementing local number portability.[154] In adopting the standards as currently set forth in the *Working Group Report*, the *Architecture Task Force Report*, the *Technical & Operational Task Force Report* and their Appendices as a framework for implementation of local number portability, we recognize that ongoing changes to these specifications and processes likely will be needed as the industry gains operational experience in implementing long-term number portability.[155] We urge the industry, working under the auspices of the NANC, to maintain, update and modify the technical and operational standards as necessary, and to establish a long-term compliance process for service providers and local number portability administrators.

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[152] *See Working Group Report* at § 6.7.5.2.

[153] *Technical & Operational Task Force* at § 5.2.

[154] The Commission's performance criteria for long-term number portability solutions are set forth at n.24, *supra*.

[155] In addition, future modifications to these standards may be required in order to permit CMRS providers to provide local number portability and to meet the changing demands of the industry in the most effective and efficient manner possible given changing technological and market conditions. Future modifications are discussed in ¶¶ 128-132, *infra*.

55. Number Portability Administration Center Service Management System Provisioning Process Flows (Provisioning Process Flows). We adopt the Provisioning Process Flows as set forth in the *Technical and Operational Task Force Report*[156] and recommended by the NANC as industry standards for use in each Number Portability Administration Center region.

56. Provisioning process flows are the detailed, standard procedures by which service providers and database administrators communicate between and among one another to port a telephone number to a new service provider, to cancel a porting request, to disconnect a ported number, or to deal with conflicts between, or audits of, service providers.[157] The Technical & Operational Task Force developed, and the NANC recommends Commission adoption of, standard processes to carry out every operation needed to implement local number portability.[158] The primary Provisioning Process Flow diagram lays out the general process by which a customer's telephone number is ported from the customer's original service provider to the customer's newly-requested service provider.[159] The subsequent Provisioning Process Flow diagrams set forth the processes by which service providers and local number portability administrators handle specific scenarios, such as porting numbers with or without unconditional ten-digit dialing triggers,[160] cancelling porting requests,[161] disconnecting ported numbers,[162] arranging audits of service providers to assist in resolution of repair problems,[163] and resolving conflicts between service providers.[164]

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[156] Pictorial representations and associated descriptions of these provisioning process flows are documented in the *Technical and Operational Task Force Report* at Appendix B -- "Inter-Service Provider LNP Operations Flows."

[157] *Id.*

[158] *Technical and Operational Task Force Report* at § 7.2.

[159] *Id.* at Appendix B -- "Inter-Service Provider LNP Operations Flows," Figure 1.

[160] *Id.* at Figures 2-3.

[161] *Id.* at Figure 5.

[162] *Id.* at Figure 7.

[163] *Id.* at Figure 8.

[164] *Id.* at Figures 4, 6.

57. In developing industry standard Provisioning Process Flows, the Technical & Operational Task Force adopted the Illinois local number portability provisioning process flows and associated descriptions as a frame of reference for developing and refining its own Provisioning Process Flows.[165] The Technical & Operational Task Force reviewed each Provisioning Process Flow scenario and modified each one to ensure industry-wide endorsement.[166] The members of the Technical & Operational Task Force also reviewed and modified the associated Provisioning Process Flow descriptions until each member of the team could endorse the selected language.[167]

58. We conclude that the uniform standards for Provisioning Process Flows proposed by the NANC are essential to the efficient deployment of local number portability across the nation. In particular, we find that uniform Provisioning Process Flows will help ensure that communication between and among service providers (using local Service Management Systems) and local number portability administrators (using Number Portability Administration Center Service Management Systems) proceed in a clear and orderly fashion so that number portability requests are handled in an efficient and timely manner. We note that no commenter opposed adoption of these standard Provisioning Process Flows. We direct the NANC to make recommendations regarding future modifications to the Commission as necessary, consistent with the procedures set forth in ¶¶ 128-132, *infra*.

59. Number Portability Administration Center Service Management System Standards -- Functional Requirements Specification. We adopt the NANC's recommendation that local number portability administrators and any entity directly connecting to the Number Portability Administration Center Service Management System be required to use the Number Portability Administration Center Service Management System Functional Requirements Specification (Functional Requirements Specification or FRS) as described in the *North American Numbering Council -- Functional Requirements Specification -- Number Portability Administration Center -- Service Management System*, Version 1.1, dated May 5, 1997 (*NANC FRS*).[168] The *NANC FRS* will serve as an industry standard for use in developing and maintaining the Number Portability Administration Center Service Management System in each of the seven Number Portability Administration Center regions.

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[165] *Id.* at § 7.1.

[166] *Id.* at § 7.2.

[167] *Id.*

[168] *Id.* at Appendix C. The *NANC FRS* is available for review on the Internet at http://www.npac.com

60. The Number Portability Administration Center Service Management System is a hardware and software platform that contains the database of information required to route ported numbers to the appropriate service provider.[169] In general, the Number Portability Administration Center Service Management System receives customer information from both the current and new service providers, validates the information received, and makes the new routing information available for downloads to local service management systems when an "activate" message is received indicating that the customer has been physically connected to the new service provider's network.[170] The Number Portability Administration Center Service Management System contains a record of all ported numbers and a history file of all transactions relating to the porting of a number.[171] The Number Portability Administration Center Service Management System also provides audit functionality and the ability to transmit routing information to service providers to maintain synchronization of the service providers' network elements that support portability.[172]

61. We note that no commenters oppose adoption of the *NANC FRS* as an industry standard. As pointed out by CTIA[173] and acknowledged by the NANC,[174] however, the *NANC FRS* was developed primarily to support the provisioning of wireline number portability. The NANC has not fully considered or developed distinct number portability requirements applicable to CMRS providers. Therefore, modifications to the *NANC FRS* may be required to support wireless number portability. As discussed in more detail below, we direct the NANC to recommend modifications to the *NANC FRS* as necessary to support wireless number portability,[175] consistent with the procedures set forth in ¶¶ 128-132, *infra*.

62. Number Portability Administration Center Service Management System Standards -- Interoperable Interface Specification. We adopt the NANC's recommendation that the local number portability administrators and any entity directly connecting to the Number Portability Administration Center Service Management System use the Number

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169 *Technical & Operational Task Force Report* at § 8.2.

170 *Id.*

171 *Id.*

172 *Id.*

173 CTIA Comments at 2.

174 *Working Group Report* at § 3.

175 *See* ¶ 92, *infra*.

Portability Administration Center Service Management System Interoperable Interface Specification (Interoperable Interface Specification or IIS) as described in the *North American Numbering Council -- Interoperable Interface Specification -- Number Portability Administration Center -- Service Management System*, Version 1.0, dated April 7, 1997 (*NANC IIS*).[176] The *NANC IIS* will serve as an industry standard for use in developing and maintaining the Number Portability Administration Center Service Management System interfaces in each of the seven Number Portability Administration Center regions.[177]

63. The *NANC IIS* defines the Number Portability Administration Center Service Management System mechanized interfaces. These interfaces reflect the functionality defined in the Functional Requirements Specification. Both Service Order Administration (SOA) and local Service Management System interfaces to the Number Portability Administration Center Service Management System are described in the *NANC IIS*.[178]

64. We note that no commenters oppose adoption of this standard. We recognize, however, that, as CTIA argues, the *NANC IIS* was developed primarily to support wireline number portability.[179] The NANC has not fully considered or developed unique wireless number portability requirements. Therefore, modifications to the *NANC IIS* may be required to support wireless number portability.[180] As discussed more fully below, we direct the NANC to recommend modifications to the *NANC IIS* as necessary to support wireless number portability,[181] consistent with the procedures set forth in ¶¶ 128-132, *infra*.

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[176] *Technical and Operational Task Force Report* at Appendix D. The *NANC IIS* is available for review on the Internet at http://www.npac.com.

[177] *Technical and Operational Task Force Report* at § 9.

[178] *Id.* at § 9.2. The interfaces are referred to as the SOA-to-NPAC SMS interface and the NPAC SMS-to-LSMS (local Service Management System) interface, respectively. The SOA-to-NPAC SMS interface, which allows communication between a service provider's operations support systems and the Number Portability Administration Center Service Management System, supports the creation and update of subscriber information, indicating whether a number has been ported and, if so, including the telephone number and location routing number. The NPAC SMS-to-LSMS interface is used for communications between a service provider's local Service Management System and the Number Portability Administration Center Service Management System so that local Service Management Systems can download the most recent list of ported numbers and routing information.

[179] *See* CTIA Comments at 2; *Working Group Report* at § 3.

[180] *Technical & Operational Task Force Report* at § 9.5.

[181] *See* ¶ 92, *infra*.

65. Policy for the Porting of Reserved and Unassigned Numbers and Compliance Process. We adopt the NANC's recommendations relating to the porting of reserved and unassigned numbers developed and documented in the *Architecture Task Force Report*.[182] Specifically, the NANC recommends that customers should be allowed to port telephone numbers that they have reserved under a legally enforceable written agreement but that have not been activated.[183] The NANC further recommends that such reserved numbers: (1) be treated as disconnected telephone numbers when the customer is disconnected or when the service is moved to another service provider and the reserved numbers are not ported to subsequent service providers; and (2) may not be used by another customer.[184] The Architecture Task Force points out that implementation of the capability to port reserved numbers may require modifications to operational support systems and may not be available initially.[185] The NANC also recommends that service providers not be allowed to port unassigned numbers unless and until there is an explicit authorization for such porting from a regulator with appropriate jurisdiction.[186]

66. Bell Atlantic and NYNEX do not challenge the NANC's recommendation that customers be allowed to port numbers which they have reserved but not activated.[187] Bell Atlantic and NYNEX assert, however, that "reserved telephone numbers should not be ported until there is a way to administer the [numbering] resource and a mechanism for ensuring that [numbers reserved for one customer] are not used for another customer."[188] Bell Atlantic and NYNEX appear concerned that, after a customer ports its activated and reserved numbers to another service provider, that customer may then relinquish the reserved numbers to the new service provider, thereby removing such numbers from the control of the original service provider. Bell Atlantic and NYNEX contend that "guidelines must be developed to ensure that there is consistency in the industry and that there is no abuse" of the

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[182] *Architecture Task Force Report* at § 7.7; *see also Technical & Operational Task Force Report* at § 10.1.

[183] *Architecture Task Force Report* at § 7.7.

[184] *Id.*

[185] *Id.*

[186] *Id.* at § 7.7.2; *Technical & Operational Task Force* at § 10.1, Appendix A-2.

[187] Bell Atlantic/NYNEX Comments at 7.

[188] *Id.* at 8.

policy for porting reserved numbers.[189] In adopting the NANC's recommendation for the porting of reserved and unassigned numbers policy, we direct the NANC to monitor the implementation of this policy, and make appropriate recommendations to the Commission, including, if deemed necessary by the NANC, guidelines for administering ported unassigned numbers that are no longer reserved by the customer that originally ported them.

67. We also conclude that the NANC has recommended a reasonable process for enforcing compliance with the policy pertaining to the porting of reserved and unassigned numbers.[190] If a service provider finds that it is disadvantaged by instances of non-compliance with the policy for the porting of reserved and unassigned numbers by another service provider, the NANC recommends several courses of action. First, the aggrieved service provider may contact the service provider with which it has a dispute to resolve the issue through informal negotiations. Should these efforts prove unsuccessful, the aggrieved service provider may bring the issue to the regional LLC for resolution via the LLC's dispute resolution process,[191] to the NANC, to the state public utilities commission, or to other bodies as deemed appropriate by the service provider.[192]

68. Change Management Process. The NANC states that changing technological and market conditions, as well as other unforeseen circumstances, may necessitate ongoing oversight of, and future modifications to, the local number portability architectural, technical and operational standards.[193] The NANC therefore recommends the adoption of standard procedures to control the process for designing, developing, testing, and implementing changes to the Number Portability Administration Center Service Management Systems, the Provisioning Process Flows, the Functional Requirements Specification, the Interoperable Interface Specification, and related specifications and processes (change management process).[194] The NANC also recommends that the Commission designate a neutral entity, preferably the NANC, to approve or disapprove all Number Portability Administration

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[189] *Id.* at 7-8.

[190] *Working Group Report* at § 6.7.3.4; *Technical & Operational Task Force Report* at § 10.2.

[191] *Technical and Operational Task Force Report* at § 10.2.4; *see also* ¶ 115, *infra.*

[192] *Working Group Report* at § 6.7.3.4; *Technical & Operational Task Force Report* at §10.2.4.

[193] *Working Group Report* at § 7.1.1D.

[194] *Technical & Operational Task Force Report* at § 11.2.1. These change management processes include the definition of standard change request documents, procedures for the submission and distribution of requests, and timetables for the process of open consideration and prioritization of such requests.

Service Management System changes, and that each respective regional LLC manage implementation of these changes with its respective local number portability administrator.[195] The NANC recommends further that, in the event the NANC is dissolved, the Commission establish or identify an oversight body to support and approve Number Portability Administration Center Service Management System architecture changes.[196]

69. We adopt the NANC's recommendations concerning the change management process. We agree with the NANC that it is important that a neutral entity oversee the change management process, so that: (1) there is consistency in the submission and consideration of changes to the architectural, technical and operational specifications and procedures; (2) uniform processes are implemented; and (3) no individual carriers or industry segments are disadvantaged.[197] We find that the NANC's proposed change management process will enable the industry to make changes to the architectural, technical and operational specifications and procedures in a timely and uniform manner. The role of the regional LLCs in managing changes to the number portability technical and operational specifications, however, is subject to our planned review of the role of the regional LLCs in implementing long-term number portability.[198] We direct the NANC to continue its oversight of architectural, technical and operational change management processes and to make additional recommendations to the Commission as necessary, consistent with the procedures set forth in ¶ 128, *infra*. In the event the NANC is dissolved at some point in the future, we will, at that time, either establish or select an oversight body to perform the change management functions now delegated to the NANC.

### c. Additional Technical and Operational Issues

70. In addition to the issues considered by the Technical & Operational Task Force, the Architecture Task Force addressed several technical matters that have been incorporated into the NANC recommendations.[199] Like the Technical & Operational Task Force, the Architecture Task Force reviewed the process used in each state and/or region to

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[195] *Architecture Task Force Report* at § 12.3.1; *see also Working Group Report* at § 7.1.1D; *Technical and Operational Task Force Report* at § 11.2.

[196] *Architecture Task Force Report* at § 12.3.1.

[197] *Technical & Operational Task Force Report* at § 11.2.2.

[198] *See* ¶ 114, *infra*, for a discussion of the ongoing role of the regional LLCs in implementing and overseeing long-term number portability.

[199] *Architecture Task Force Report* at § 7.

develop the Functional Requirements Specification and Interoperable Interface Specification and determined that the Number Portability Administration Center roles and responsibilities defined in those specifications were substantially similar.[200] The Architecture Task Force also found that the Functional Requirements Specification and Interoperable Interface Specification thoroughly document standard functions necessary to administer the Number Portability Administration Center Service Management System, the interfaces between the Number Portability Administration Center Service Management System and the various service providers, as well as the administrative functions to be performed by the local number portability administrators.[201] Like the Technical & Operational Task Force, the consensus in the Architecture Task Force called for adoption of the *NANC FRS* and the *NANC IIS* which set forth the Number Portability Administration Center Service Management System Functional Requirements Specification and the Interoperable Interface Specification.[202]

71. The NANC indicates that the recommendations derived from the *Architecture Task Force Report* were the result of extensive debate in the Architecture Task Force and represent industry consensus.[203] With one exception discussed more fully below,[204] no parties have specifically challenged the local number portability architectural specifications and assumptions as set forth in the *Architecture Task Force Report*. We conclude that these recommendations set forth reasonable Number Portability Administration Center standards to manage local number portability. Thus, we adopt the NANC's recommendations, as presented in the *Architecture Task Force Report*.

72. The *Architecture Task Force Report* considered and made recommendations on several issues which were not otherwise addressed in the *Technical & Operational Task Force Report*, including the following: (1) what entity shall be required to make the query to determine the service provider of the called party (N-1 Call Routing);[205] and (2) whether

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[200] *Working Group Report* at § 6.5.3.

[201] *Architecture Task Force Report* at § 12.1.

[202] *Id.*

[203] *Working Group Report* at §§ 2.6, 6.5.5.

[204] CTIA's concern regarding the potentially discriminatory effect of default routing on CMRS providers is discussed at ¶¶ 76-78, *infra*.

[205] *Architecture Task Force Report* at § 7.8.

carriers may block default routed calls (Default Routing).[206] Because these two specific issues will have a significant impact on the efficiency and effectiveness of local number portability, each will be discussed more fully below.

73. N-1 Call Routing. The NANC recommends that the carrier in the call routing process immediately preceding the terminating carrier, designated the "N-1" carrier,[207] be responsible for ensuring that database queries are performed.[208] None of the parties commenting on the NANC's recommendations addresses this issue. We adopt the NANC's recommendation that the N-1 carrier be responsible for ensuring that databases are queried, as necessary, to effectuate number portability. The N-1 carrier can meet this obligation by either querying the number portability database itself or by arranging with another entity to perform database queries on behalf of the N-1 carrier.

74. In the *First Order on Reconsideration*, the Commission recognized that queries would most likely be performed by the N-1 carrier if the industry adopted the Location Routing Number solution.[209] Industry consensus is that the Location Routing Number system is the best method to satisfy the Commission's performance criteria for long-term local number portability.[210] The efficient provisioning of number portability requires that all carriers know who bears responsibility for performing queries, so that calls are not dropped because the carrier is uncertain who should perform the database query, and so that carriers

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[206] *Id.* at § 7.10. A default routed call is a call that is transported to the customer's original local exchange carrier without having been queried to determine whether the customer has ported the number to another local exchange carrier. *See* ¶¶ 76-78, *infra.*

[207] The "N" carrier is the entity terminating the call to the end user, and the "N-1" carrier is the entity transferring the call to the N, or terminating, carrier.

[208] *Architecture Task Force Report* at § 7.8 and Attachment A -- "Example N-1 Call Scenarios." The NANC's recommendation of N-1 call routing is based on the assumption that service providers will use Location Routing Number as the database method for local number portability. *See Architecture Task Force Report* at § 7.2. For a discussion of the Location Routing Number system, *see* ¶ 8, *supra.*

[209] *First Order on Reconsideration* at ¶ 125.

[210] *See First Order on Reconsideration* at ¶¶ 8-9. For a discussion of the Commission's performance criteria, *see* ¶ 7, *supra.* The NANC has assumed that the Location Routing Number system will serve as the database method to implement local number portability and has developed its specifications and procedures in conformance with proper functioning of the Location Routing Number system. *See Architecture Task Force Report* at § 7.2. The state commissions, state and regional workshops and the industry are all relying on the Location Routing Number system as the database method to implement long-term number portability. *See First Order on Reconsideration* at ¶¶ 8-9; *see also* ¶ 8, *supra.*

can design their networks accordingly or arrange to have database queries performed by another entity. Consistent with our finding in the *First Order on Reconsideration*, we conclude that the Location Routing Number system functions best if the N-1 carrier bears responsibility for ensuring that the call routing query is performed.[211] Under the Location Routing Number system, requiring call-terminating carriers to perform all queries may impose too great a burden on terminating LECs. In addition, obligating incumbent LECs to perform all call routing queries could impair network reliability.[212]

75. We note, however, that the requirement that the N-1 carrier be responsible for ensuring completion of the database query applies only in the context of Location Routing Number as the long-term number portability solution. In the event that Location Routing Number is supplanted by another method of providing long-term number portability, we may modify the call routing process as necessary. We note further that if the N-1 carrier does not perform the query, but rather relies on some other entity to perform the query, that other entity may charge the N-1 carrier, in accordance with guidelines the Commission will establish to govern long-term number portability cost allocation and recovery.[213]

76. Default Routing. The NANC recommends that we permit carriers to block "default routed calls" coming into their networks.[214] A "default routed call" situation would occur in a Location Routing Number system as follows: when a call is made to a telephone number in an exchange with any ported numbers, the N-1 carrier (or its contracted entity) queries a local Service Management System database to determine if the called number has been ported. If the N-1 carrier fails to perform the query, the call is routed, *by default*, to the LEC that originally serviced the telephone number. The original LEC, which may or may not still be serving the called number, can either query the local Service Management System and complete the call, or "block" the call, sending a message back to the caller that the call cannot be delivered. The NANC found that compelling LECs to query all default routed calls could impair network reliability, and that allowing carriers to block default routed calls coming into their networks is necessary to protect against overload or congestion that could result from an inordinate number of calls being routed by default to the original

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[211] *First Order on Reconsideration* at ¶ 125.

[212] *See* US West *Ex Parte* Presentation at 6-8, CC Docket No. 95-116, filed June 5, 1997 (US West June 5, 1997 *Ex Parte* Filing); *see also First Order on Reconsideration* at ¶¶ 124-125.

[213] *See First Order on Reconsideration* at ¶ 126.

[214] *Architecture Task Force Report* at § 7.10.

LEC.[215] In light of these network reliability concerns, we will allow LECs to block default routed calls, but only in specific circumstances when failure to do so is likely to impair network reliability.

77. CTIA argues that the NANC's default routing recommendation will significantly, and negatively, affect CMRS providers.[216] According to CTIA, even if number portability is limited initially to the wireline network, CMRS providers must still modify their method of routing calls from their customers to wireline customers who have ported their numbers. During the period prior to December 31, 1998, the date by which CMRS providers are required to have the capability to deliver calls to ported numbers,[217] CMRS providers that have not yet implemented such capability will be required to rely on default routing to complete subscriber calls. CTIA argues that default routed calls should not be blocked, because "[a]llowing incumbent LECs to block default routed calls when they may be acting as the only means of conducting a query and, thus, allowing a call to be completed, would discriminate against wireless carriers . . . ."[218]

78. In the *First Report & Order*, we required CMRS providers to have the capability of querying number portability database systems in order to deliver calls from their networks to ported numbers anywhere in the country by December 31, 1998.[219] We established this deadline so that CMRS providers would have the ability to route calls from their customers to a wireline customer who has ported his or her number, by the time a substantial number of wireline customers have the ability to port their numbers between wireline carriers.[220] Under this deployment schedule, the initial deployment of long-term local number portability for wireline carriers will occur prior to the date by which CMRS providers must be able to perform database queries. During this period, CMRS providers are not obligated by our rules to perform call routing queries or to arrange for other entities to perform queries on their behalf. Thus, if wireline LECs are allowed to block default routed calls, calls originating on wireless networks (to the extent that the CMRS provider is the N-1 carrier) could be blocked. For this reason, we will only allow LECs to block default

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[215] *Id.*

[216] CTIA Comments at 4.

[217] *First Report & Order*, 11 FCC Rcd at 8439-40, ¶ 165.

[218] CTIA Comments at 5.

[219] *First Report & Order*, 11 FCC Rcd at 8439-40, ¶ 165.

[220] *Id.*

routed calls when performing database queries on default routed calls is likely to impair network reliability. We also require LECs to apply this blocking standard to calls from all carriers on a nondiscriminatory basis. In the event that a CMRS or other service provider believes that a LEC is blocking calls under circumstances unlikely to impair network reliability, such service provider may bring the issue before the NANC. We direct the NANC to act expeditiously on these issues. Although CMRS providers are not responsible for querying calls until December 31, 1998, we urge them to make arrangements with LECs as soon as possible to ensure that their calls are not blocked. We note that if a LEC performs database queries on default routed calls, the LEC may charge the N-1 carrier, pursuant to guidelines the Commission will establish regarding long-term number portability cost allocation and recovery.[221]

79. Disconnected Ported Numbers. The NANC also recommends that when a ported telephone number is disconnected, that telephone number be released or "snapped-back" to the original service provider assigned the NXX.[222] None of the commenters challenges this recommendation. Although Bell Atlantic and NYNEX assert that guidelines must be developed to ensure consistent application of the "snap back" policy and to ensure that parties do not "abuse" the "snap-back" policy,[223] they do not suggest specific guidelines for avoiding these problems. We find this NANC recommendation reasonable and the result of industry-wide consensus. Accordingly, we adopt the recommendation. We ask the NANC to prepare recommendations, consistent with the procedures set forth in ¶¶ 128-132, *infra*, to clarify the policy if it determines that there is confusion among the industry regarding its application. We urge Bell Atlantic and NYNEX to suggest specific proposals for guidelines to the NANC for consideration in connection with the NANC's preparation of further recommendations.

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[221] *See First Order on Reconsideration* at ¶ 126.

[222] *Architecture Task Force Report* at § 7.9. Under the North American Numbering Plan, telephone numbers consist of ten digits in the form NPA-NXX-XXXX, where N may be any number from 2 to 9 and X may be any number from 0 to 9. Numbering plan areas (or NPAs) are known commonly as area codes. The second three digits of a telephone number are known as the NXX code. Typically, the NXX code identifies the central office switch to which the telephone number had been assigned or central office code (CO). Each NPA-NXX contains a total of 10,000 different telephone numbers. Because an NPA-NXX is only served by a single end office in today's public switched telephone network, the telephone number identifies the subscriber, as well as the actual end office, or telephone switching system, that serves that subscriber. In effect, the dialed NPA-NXX is the terminating switch's routing address to the rest of the network. With the implementation of local number portability, which allows any number of local service providers to serve the same NPA-NXX, this routing scheme can no longer be used. *Numbering Plan Order*, 11 FCC Rcd at 2593-94.

[223] Bell Atlantic/NYNEX Comments at 7-8.

80. High Volume Call-In Networks. The Architecture Task Force did not reach consensus on how to provide local number portability to high volume call-in networks.[224] Currently, a service provider may move a customer's telephone number(s) to a high volume call-in network when the service provider determines that the customer regularly generates large volumes of terminating traffic over a short period of time, so that the surge in telephone calls will not overload the network. A high volume call-in network allows all such customers to be assigned numbers in an NPA-NXX (*e.g.*, 213-520) dedicated for high volume call-in. Switches in the network can be designed to segregate traffic for high volume call-in numbers and route it via trunk groups that are dedicated to the network and do not overflow to other trunk groups. The dedicated trunks are engineered to handle a particular traffic load and, in this way, traffic volumes are limited, and traffic to high calling volume numbers cannot congest the network. According to the findings of the Architecture Task Force, such networks can effectively limit network congestion caused by large call-in events.[225]

81. The Location Routing Number method for local number portability requires a database query to be performed on calls to portable NPA-NXXs before route selection takes place. If high volume call-in network numbers are portable, they could generate large volumes of queries that could congest the Service Control Points.[226] Also, if a high volume call-in network number is ported and a location routing number is returned in the database response, the call will not be routed via trunks dedicated to high volume call-in networks. This congestion can in turn affect other services and compromise the design of high volume call-in network networks.[227] The Architecture Task Force suggests that one way to avoid this problem is to prohibit database queries for numbers attached to switches serving high volume call-in network networks.[228]

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[224] *Architecture Task Force Report* at § 7.13. A high volume call-in network is a network designated specifically for a customer that generates large volumes of terminating traffic over a short period of time, such as a radio station that holds contests requiring many listeners to call simultaneously. A high volume call-in network allows for these surges in telephone calls without overloading the network. In contrast, a customer that simply generates a large volume of terminating traffic on a more consistent basis would not be transferred to a high volume call-in network.

[225] *Id.*

[226] *Id.* Service Control Points are discussed at n.29, *supra.*

[227] *Architecture Task Force Report* at § 7.13.

[228] *Id.*

82. Bell Atlantic and NYNEX contend that the NANC must conduct further study before high volume call-in numbers are ported to ensure that calls to such numbers do not cause network congestion.[229] We agree that additional study is necessary before we allow porting of numbers to high volume call-in networks. We, therefore, urge the industry, under the auspices of the NANC, to study this matter further and prepare recommendations on how best to incorporate high volume call-in networks into the local number portability scheme. We direct the NANC to continue to examine this matter and make recommendations to the Commission consistent with the procedures set forth in ¶¶ 128-132, *infra*.

## C. Numbering Information Sharing

### 1. Background

83. In the *First Report & Order*, the Commission noted that "it will be essential for the [North American Numbering Plan Administrator] to keep track of information regarding the porting of numbers between and among carriers."[230] The Commission, therefore, directed the NANC "to set guidelines and standards by which the [North American Numbering Plan Administrator] and [local number portability administrators] share numbering information so that both entities can efficiently and effectively administer the assignment of the numbering resource."[231] The NANC determined that the manner in which the North American Numbering Plan Administrator and the local number portability administrators might share numbering information is an aspect of number pooling outside the scope of the Working Group's immediate mission.[232] As a result, the NANC did not make

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[229] Bell Atlantic/NYNEX Comments at 8.

[230] *First Report & Order*, 11 FCC Rcd at 8402, ¶ 95.

[231] *Id.* As an example, the Commission suggested that the NANC might require that the Service Management System databases easily integrate with 911 databases.

[232] *Working Group Report* at § 6.8.1. According to the Industry Numbering Committee (INC):

> Pooling of geographic numbers in a local number portability environment is a number administration and assignment process that allocates numbering resources to a shared reservoir associated with a designated geographic area. Initially, the designated geographic area is limited to an existing rate center within a geographic NPA. The numbering resources in the shared reservoir would be available, potentially, in blocks of numbers or on an individual number basis, for assignment to competing service providers participating in local number portability for the purpose of providing services to customers in that area.

Industry Numbering Committee, Status Report on Issue 105 -- Number Pooling at 6 (June 10, 1997). The INC

any recommendations with respect to the sharing of numbering information.[233] The NANC acknowledges, however, that "[n]umber pooling and any other steps required to achieve number utilization efficiency are a short term priority."[234] The NANC added that "[t]o ensure a coordinated number pooling effort, interaction between the "[North American Numbering Plan Administrator] and the [local number portability administrators] is required during the design, development, and implementation of number pooling."[235] As such, the NANC recommends that its Local Number Portability Administration Selection and North American Numbering Plan Administration Working Groups work jointly in support of number utilization efficiency.[236]

### 2. Positions of the Parties

84. CTIA notes that some state commissions are already moving towards mandating number pooling in order to conserve numbering resources.[237] CTIA asserts that such number pooling requires that all carriers have equal access to the same shared reservoir of numbers.[238] Given the staggered implementation dates of wireless and wireline number portability, however, CTIA contends that "mandating number pooling would unfairly disadvantage wireless carriers in their ability to have access to increasingly scarce number resources."[239] Until CMRS providers are fully incorporated into the local number portability environment, CTIA is concerned that such carriers will not have equal access to numbering

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is a standing committee of the Industry Carriers Compatibility Forum (ICCF), which in turn exists under the auspices of the Carrier Liaison Committee (CLC) of the Alliance for Telecommunications Industry Solutions (ATIS). ATIS sponsors a number of industry committees and forums, including the CLC, ICCF and INC. The CLC seeks to resolve, through consensus procedures, equal access and network interconnection issues arising on a communications industry-wide basis.

[233] *Working Group Report* at § 6.8.

[234] *Id.* at § 7.1.1A.

[235] *Id.*

[236] *Id.*

[237] CTIA Comments at n.11.

[238] *See id.*

[239] *Id.*